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Basic Trends in Outsourcing and Offshoring in Canada

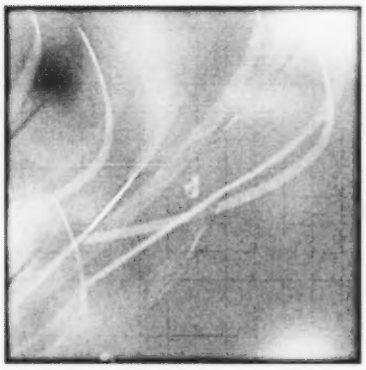

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Table of contents

Abstract 5

Executive summary 6

1 Introduction 7

2 Trend in offshoring and outsourcing 8

2.1 Outsourcing and offshoring in the aggregate business sector 9
2.2 Outsourcing and offshoring at the industry level 18

3 Conclusions 22

Appendix 24

References 26

Abstract

This paper presents the long-term trends in outsourcing and offshoring across Canadian industries.

Keywords: Canada, offshoring, outsourcing

Executive summary

Outsourcing involves moving production outside of a firm. Offshoring entails sourcing part of the purchased inputs of a firm outside of the country.

Outsourcing decisions affect the boundaries of the firm—what production takes place within the firm and what is purchased from outside the firm.

Changes in offshoring may be, but are not necessarily, related to changes in outsourcing. They involve decisions both to purchase outside the firm and to do so from abroad. Considerations to do the latter are at the heart of the study of international trade.

Interest in outsourcing arises because it may presage changes in industrial structure. Interest in offshoring arises because it may signify changes in international trading patterns.

The paper presents data on long-term trends in outsourcing and offshoring across Canadian industries, using detailed industry data derived from Statistics Canada's input–output tables. It asks whether there is evidence of changes in outsourcing or offshoring patterns. It finds:

1) While concern about *material* outsourcing has been expressed, there has been little change in the ratio of material inputs to gross output over the period from 1961 to 2003. There is little evidence that changes in the boundary of the average firm is occurring when it comes to materials purchases.
2) There has been a trend to *service* outsourcing. Service outsourcing has increased in almost all industries. The rate of growth was highest in service industries.
3) With post-Second World War trade liberalization, there has been a steady growth in the offshoring of material and service inputs. Canadian industries have purchased an increasing share of material and service inputs from abroad. Increases in the import share of material and service inputs have been pervasive across industries. The share of imports in material inputs almost doubled while the share of imports in service inputs almost tripled from 1961 to 2003. Most of service offshoring has taken place in the service sector.
4) Business services represent the largest category of service inputs being offshored by Canadian industries, followed by financial services and insurance services.
5) The increase in the share of imported service inputs in total material and service inputs is a result of both an increase in import intensity and an increase in the share of services inputs in total material and service inputs for all main categories of service inputs, except for business services. The import intensity of business services was virtually unchanged over time.
6) Most of the offshoring that occurred was with the United States, though there has been some increase over the last decade with developing countries.

1 Introduction

Outsourcing involves moving a portion of production outside of a firm. Offshoring entails sourcing part of inputs outside the country.

While recent interest in outsourcing and offshoring has intensified with rapid economic development in China and India, both these phenomena are at the core of industrial economics—which focuses on firm behaviour—and international economics—which focuses on the reasons behind trade between nations.

Outsourcing decisions affect the boundaries of the firm—what takes place within the firm and what takes place outside the firm (Williamson, 1975). Firms always face the choice between making or buying when it comes to the inputs that they need in order to produce their product. When they choose to make the inputs themselves, they essentially extend the boundary of the firm. When they outsource the input, they are restricting it. In the first case, the firm becomes more integrated; in the second case, disintegration occurs.

Outsourcing increases the amount of churn in an economic system. It will lead to each firm producing a smaller portion of the final product. When disintegration in the economic process takes place, a firm purchases more of its inputs and creates less value added in the total production chain by itself.

The term 'offshoring' or 'foreign outsourcing' implies shifts in intra-firm or intra-plant supplies to outside providers in a foreign country. The consequence of such a decision is the re-allocation of jobs and production to a foreign country. The term 'outsourcing' includes both offshoring and domestic outsourcing which takes place when outside providers are located in the same country. Outsourcing does not necessarily imply that jobs and production are relocated to another country (Garner 2004).[1]

Offshoring may be, but is not necessarily, related to outsourcing. It involves decisions both to purchase outside the firm and to do so from abroad. Considerations to do the latter are at the heart of the study of international trade.

Recent interest in outsourcing is related to the notion that new forces are at work to change the production boundaries of firms. Progress in transportation technology that has reduced transportation costs, along with new information and communications technologies (ICT) that allow for improved coordination of geographically dispersed production processes, are seen to be leading to the disintegration of production processes.

At the same time, reductions in trade barriers over the last 50 years have led to increased trade. Some of this has led to increased imports of inputs to the production process. This, in turn, is seen to be contributing to more offshoring—the sourcing of inputs abroad.

1. There is no commonly accepted definition of offshoring in the public debate or in the economic literature. The definition we have adopted is used in most empirical studies on offshoring (Olsen 2006).

While there is considerable discussion of the outsourcing and offshoring issue in Canada, there have been few empirical studies of its size and impact.[2]

This paper provides empirical evidence for Canada for the period since 1961. It extends previous studies on service offshoring to include the service-producing industries. Most previous empirical studies on service offshoring have focused on the manufacturing industries, due to the lack of consistent time-series data for the service sector. This is unfortunate, as most service offshoring is undertaken by the service-producing industries. To fill this gap, this paper examines service offshoring in both the manufacturing and services sectors.

The main data for the empirical analysis is a detailed set of industry data using the KLEMS (Capital, Labour, Energy, Materials and Services) database maintained by the Productivity Accounts at Statistics Canada. This industry database provides consistent time series data on gross output, capital input, labour input, and energy, material and service intermediate inputs for industries based on the 1997 North America Industry Classification System (NAICS) (Baldwin, Gu and Yan 2007).

For the purpose of this paper, we have developed a measure of offshoring by industry that has been merged with the KLEMS database. The measure represents the imported portion of material and services inputs and has been used in previous studies on offshoring (e.g., Feenstra and Hanson 1996, 1999; Amiti and Wei 2005; and Morissette and Johnson 2006).

2 Trend in offshoring and outsourcing

The input–output tables that are associated with the National Accounts produce estimates of gross value of output of all firms, the difference between output and input costs (termed value added) and the value of inputs purchased. Increased disintegration does not change the amount of value added produced across all firms, but it does increase the value of goods purchased and sold in total. Industries that are completely integrated will purchase nothing and only sell a final product. If the same industry is divided into many firms where each firm produces only a small part of the total product and ships on to the next firm, the total value of sales that are registered in the input–output tables will increase, as will the volume of inputs purchased, but the total value added will remain unchanged (unless productivity changes).

Changes in the degree of integration in the economic system then are revealed by changes in the ratio of inputs to outputs, or value added to shipments at the industry level and these will form the measure of outsourcing examined here.

2. For one such study, see Liu and Treffler (2006).

For offshoring, we adopt the measure suggested by Feenstra and Hanson (1996, 1999):

$$offshoring_i = \sum_j [\text{input purchases of commodity } j \text{ by industry } i] * \left[\frac{\text{imports of commodity } j}{\text{production}_j + \text{imports}_j - \text{exports}_j} \right].$$

The second term in brackets is the average share of imports in domestic use across all users including industries, individuals and the public administration sector. The estimates of imported intermediate inputs by industry are based on the assumption that the average import share applies to all users.

This constant-import-share assumption will provide a good estimate of the size of offshoring for a commodity, if the commodity is mainly used for intermediate consumption. But the industry distribution of offshoring depends upon whether industries using the commodity have similar import propensities. Yuskavage, Strassner and Medeiros (2006) have compared the industry distribution of the resulting estimate of business services imports with a survey estimate. The two measures are quite similar when industries are defined at an aggregate level.

2.1 Outsourcing and offshoring in the aggregate business sector

Changes in material outsourcing and service outsourcing

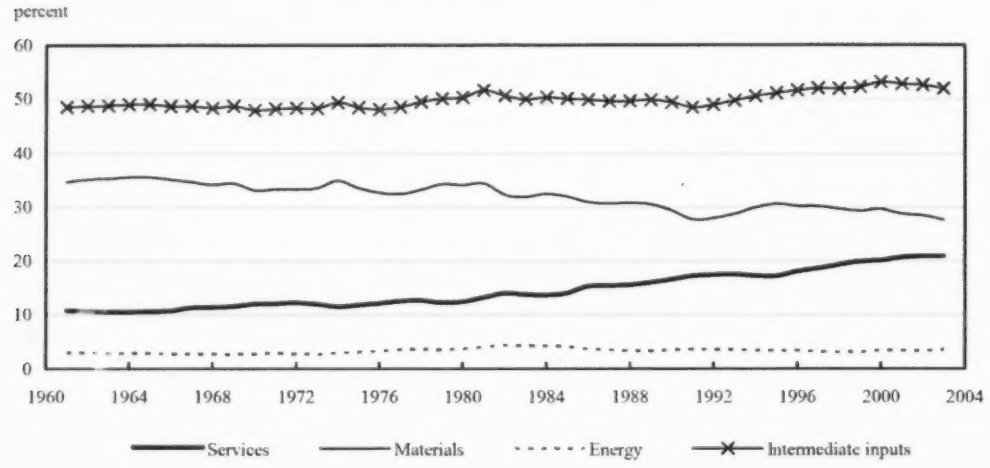
Intermediate input as a fraction of nominal gross output in the Canadian business sector is plotted in Figure 1. Intermediate input is divided into materials, purchased services and energy inputs. The material input represents all commodity inputs exclusive of fuel (electricity, fuel oil, coal, natural gas and other miscellaneous fuels) but inclusive of fuel-type inputs used as raw materials in a manufacturing process, such as crude petroleum used by the refining industry. The service input consists of the following nine types: communications; finance and insurance; real estate rental; hotel services; repair services; business services, including equipment rental, engineering and technical services, and advertising; vehicle repair; medical and educational services; and purchases from government enterprises. The energy input represents the various fuels purchased for use as heat or power including electricity, fuel oil, coal, natural gas, and other miscellaneous fuels.

The share of intermediate inputs in the Canadian business sector shows a slight increase over time. Intermediate inputs accounted for 48.5% of gross output in 1961. In 2003, it accounted for 52.0%. This represents a 3.5-percentage-point increase from 1961 to 2003.

The purchased service inputs as a fraction of gross output showed a large increase over the period: it rose from 10.9% in 1961 to 20.9% in 2003—a 10.0-percentage-point increase over the period.

The share of purchased services increased in almost all industries, except in the miscellaneous manufacturing sector (see Appendix Table A.1). The industries with the largest growth are mostly within the service sector.

Figure 1
The share of intermediate inputs in gross output in the business sector



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

To ascertain if the share of purchased services increased because of a shift in industry composition, we decomposed the total change into two components: one from the changes in the service-input share taking place within industries, holding constant the industry composition; and the other from the shifts in the industry composition (Table 1). The results show that the increase in the service-input share within industries accounted for a 7.8-percentage-point increase or 78% of the change in the aggregate share of service inputs in output. The remaining 2.2-percentage-point change came from shifts in the industry composition of gross output toward services industries with relatively high service-input shares.

Table 1
Decomposition results for changes in the share of intermediate inputs in gross output in the total business sector, 1961 to 2003

	Total change	Within industry	Between industries
	percent		
Share of intermediate inputs in gross output	3.44	7.34	-3.90
Share of materials in gross output	-7.07	-1.42	-5.66
Share of services in gross output	10.03	7.79	2.24
Share of energy in gross output	0.48	0.97	-0.49

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

Material inputs, as a fraction of gross output in the aggregate business sector, declined over time—from 34.6% in 1961 to 27.6% in 2003. The 7.9-percentage-point decline was mostly the result of a shift in the composition of output toward services-producing industries with low material-input share (as shown in Table 1). The within-industry contribution to the changes in the aggregate share of material inputs was small. This indicates that there were few changes in the share of material inputs in gross output at the industry level (see also Appendix Table A.2 that confirms this).

The cost of energy inputs was a small share of gross output in the aggregate business sector. It increased over the period from 1961 to the early 1980s and then declined afterwards. Over the period 1961 to 2002, the share of energy inputs in gross output rose from 3.0% to 3.5%. The increase in the aggregate energy-input share is a result of increases taking place at the industry level.

In summary, while concern about material outsourcing has been expressed, there has been little change in the ratio of material inputs to gross output across Canadian industries over the 1961-to-2003 period. There is little evidence that changes in the boundary of the average firm is occurring when it comes to materials purchases.

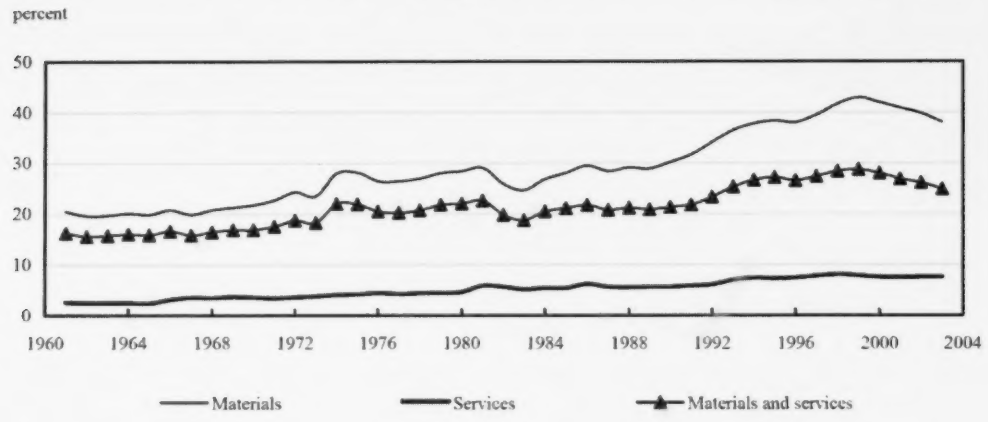
However, there has been a trend to service outsourcing. Service outsourcing has shown a dramatic increase across Canadian industries. Over the 1961-to-2003 period, the share of purchased services in gross output doubled.

Changes in material offshoring and service offshoring

Trends in the import share of material and service inputs in the aggregate business sector are plotted in Figure 2. With post-Second World War trade liberalization, there has been a steady growth in the offshoring of material and service inputs over time. Canadian industries have purchased an increasing share of material and service inputs from abroad. The share of imports in total material and service inputs increased from 16.2% to 24.9% over the 1961-to-2003 period.[3]

3. There has been a decline in the share of imported material inputs since the late 1990s, possibly due to the appreciation of the Canadian dollar that has made imports to Canada more expensive.

Figure 2
Import share of service and material inputs in the business sector, 1961 to 2003



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

The share of imports in intermediate inputs can be decomposed into two components. The first component reflects the effect of changes in the share of imports in intermediate inputs at the industry level, holding constant the industry distribution of intermediate inputs. It is positive if there is an increase in the share of imports in intermediate inputs at the industry level. The second component represents the effect of shifts in the industry composition of intermediate inputs, holding constant the share of imports in intermediate inputs at the industry level. It is positive if there is a shift in the share of intermediate inputs toward the industries with relatively high import share of intermediate inputs.[4]

The results in Table 2 show that the increase in the share of imports in intermediate inputs in the total business sector is entirely due to the increase in the share of imports in intermediate inputs at the industry level over the period from 1961 to 2003. Of the 8.8-percentage-point increase in the import share of total material and service inputs over the period, the increase in the import share of intermediate inputs within industries contributed 9.5-percentage-points of the increase (Table 2). The shift in industry composition made a small and negative contribution to the overall changes.

4. This is the standard shift-share analysis.

Table 2
Decomposition results for changes in the share of imports in intermediate inputs in the total business sector, 1961 to 2003

	Total change	Within industry	Between industries
	percent		
Share of imports in total non-energy intermediate inputs	8.67	9.48	-0.80
Share of imports in materials input	6.02	7.33	-1.31
Share of imports in services input	2.65	2.14	0.51

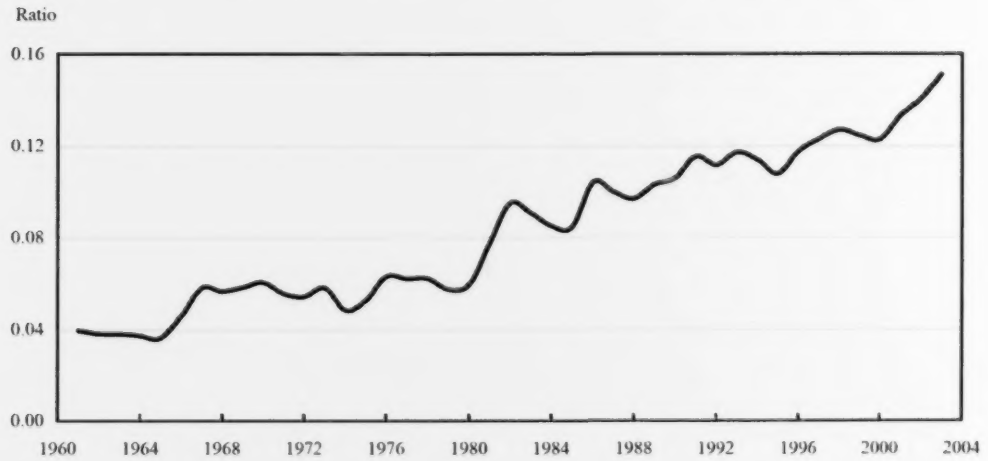
Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

The increase in import shares occurred for both material and service inputs. The share of imports in material inputs almost doubled, while the share of imports in service inputs almost tripled from 1961 to 2003. During that period, the import share rose from 20.5% to 38.0% for material inputs, while it rose from 2.6% to 7.6% for service inputs.

Over the 1961-to-2003 period, the import share of materials and the import share of service inputs both increased in almost all industries (Appendix Tables A.1 and A.2). The import share of material inputs increased by an average of 17.5 percentage points, while the import share of service inputs rose by 5.0 percentage points.

Most offshoring activities are in material inputs. Service offshoring is still at a relatively low level compared with material offshoring. In 2003, service-input imports were about 15% of material-input imports (Figure 3). But service offshoring is growing much more rapidly than material offshoring. From 1961 to 2003, the imports of service inputs increased at a rate 11.9% per year, while the imports of material inputs increased at a rate of 8.8% per year.

Figure 3
Ratio of service-input imports to material-input imports in the business sector



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

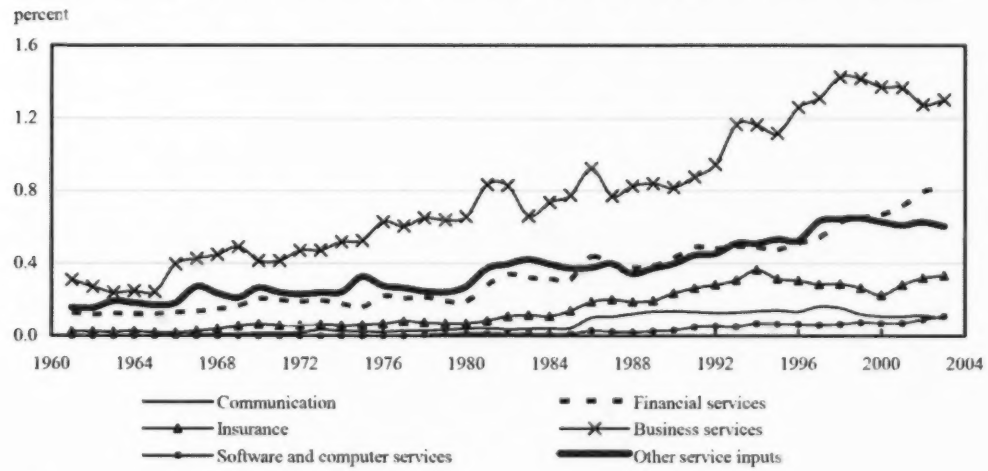
Types of services being offshored

The trends in service offshoring since 1961 by types of service inputs are graphed in Figure 4. Service offshoring is calculated as the share of imported services in total material and service inputs.

We have divided service inputs into five main categories, plus a residual other service category. The five categories are: business services, except software and computer services; financial services; insurance; communication; and, software and computer services. Business services consist of (1) engineering, scientific, accounting and legal services; (2) software and computer services; (3) advertising services; and (4) other services to business. The financial services consist of other financial intermediation and real estate services, and imputed service charges, banks and other deposit-accepting intermediaries.

Figure 4 shows that service offshoring increased in all five categories of service inputs over the 1961-to-2003 period. The share of imported business services in total material and service inputs increased from 0.3% to 1.3% over the period (Figure 4). The share of imported financial services rose from 0.1% of total non-energy inputs to 0.8%. The share also increased for insurance, communication, software and computer services, but the increase was much smaller here.

Figure 4
Service imports in total material and service inputs by type in the business sector



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

The increase in the share of imported service inputs in total material and service inputs is a result of both an increase in import intensity and an increase in the share of services inputs in total material and service inputs for all main categories of service inputs, except for business services.[5] The import intensity of business services was virtually unchanged over time (Table 3).

As shown in Figure 4, business services represent the largest category of service inputs being offshored by Canadian industries, followed by financial services, and insurance services. The offshoring of communication, software and computer services is less important.

Table 3
Changes in the share of imported service inputs in total material and service inputs in the business sector, 1961 to 2003

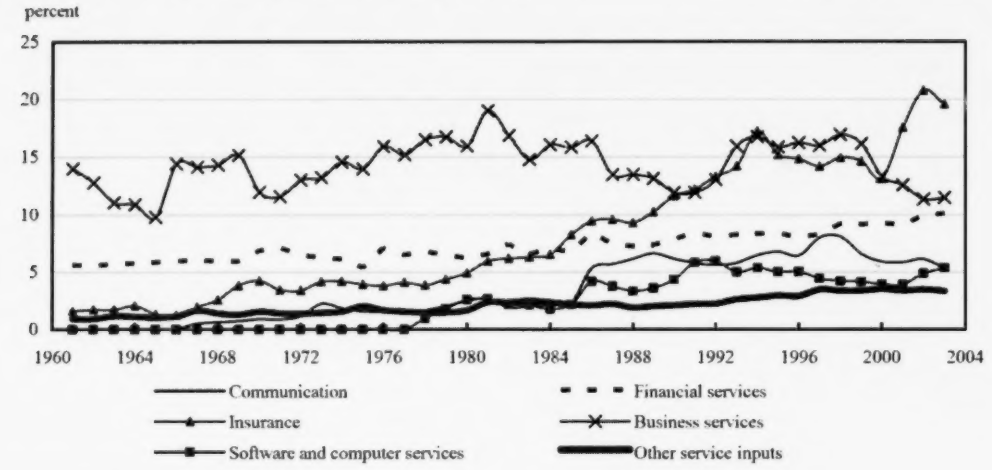
	Total changes	Changes in import share of the service input	Changes in share of the service input in total material and service inputs
		percent	
Share of imports in the following service inputs in total material and service inputs			
Communication	0.10	0.08	0.01
Financial	0.70	0.23	0.46
Insurance	0.31	0.29	0.02
Business services	0.99	-0.17	1.16
Software and computer	0.11	0.06	0.05
Other service inputs	0.45	0.42	0.03

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

While the overall level of service offshoring by Canadian industries is still fairly low, the practice has become quite significant for business services (excluding software and computer use), financial services, and insurance (Figure 5). From 2000 to 2003, 12.2% of business service input was imported from foreign countries, and 17.7% of insurance services and 9.6% of financial services were imported from abroad.

5. Changes in the share of imported services in total inputs can be decomposed into two components. The first component is the effect of the changes in import intensity, which is calculated as the changes in the shares of imports in services inputs times the average share of services inputs in total inputs. The second component represents the effect of changes in the share of service input in total inputs, calculated as the changes in the share of service inputs in total inputs times the average share of imports in service inputs.

Figure 5
Import intensity by type of service inputs in the business sector, 1961 to 2003



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

Table 4 contains the top 15 categories of service inputs with the largest imports, according to the detailed commodity aggregation provided by the input–output tables. Various types of business services are among the top 10 categories of service inputs with the largest dollar value of imports. In 2003, Canadian industries offshored 7.3 billion dollars in business services, accounting for 25.7% of total service-input imports. The offshoring of engineering, scientific, accounting and legal services amounted to 4.0 billion dollars in 2003 and accounted for 14.0 % of total service imports. The offshoring of software and computer use, and advertising services was small.

The business sector offshored 7.1 billion dollars in financial services in 2003, accounting for 25.3% of total services.

The offshoring of insurance services was 2.9 billion dollars in 2003. Together, the businesses services, financial services and insurance accounted for 78.5% of service offshoring by Canadian industries.

Table 4 also contains total imports and exports by categories of services, which covers total imports and exports by individuals, business sectors and non-business sectors. When imported service inputs are large relative to total imports, there is little final consumption. It is evident that the majority of imports in business services (lines 1, 2, 3 and 5) are for intermediate use by industries of the business sector. Only a small portion of imports in business services was for personal consumption and intermediate consumption by the non-business sector.

Table 4
Imports and exports in services, 2003

Types of commodities	Imports of services used as inputs	Share in imports of service inputs	Imports of services for inputs and final demand	Exports of services for inputs and final demand
	$ millions	percent	$ millions	$ millions
Other services to business and persons	7,294	25.74	8,493	11,057
Other financial intermediations and real estate (non-rent) services	6,789	23.96	10,472	4,129
Engineering, scientific, accounting and legal services	3,954	13.95	4,645	4,197
Insurance	2,894	10.22	6,900	4,809
Software development, computer service and rent	940	3.32	1,692	5,030
Motion picture, audio and video services	845	2.98	1,160	1,113
Telephone and other telecommunications	752	2.65	1,367	1,443
Rental, video and recording equipment, other machinery and equipment	722	2.55	1,065	494
Air transportation	680	2.40	3,935	2,992
Truck transportation	608	2.14	1,832	3,345
Postal services	582	2.05	824	916
Implicit service charges, banks and other depository credit intermediations	336	1.19	844	1,569
Rental of automobiles and trucks	295	1.04	404	522
Water transport	225	0.79	499	1,217
Repair service for machinery and equipment	193	0.68	351	1,599
All other services	1,227	4.33	17,413	14,665
Sum	28,335	100.00	61,894	59,096

Note: Authors' calculations from data. Imports and exports in services are ranked by the size of imports in service inputs.
Source: Statistics Canada, Input–Output Accounts.

About 55% of total imports in financial and insurance services are used for intermediate inputs (offshoring).

Services offshoring by trading partners

The distribution of imports in commercial services by trading partners is presented in Table 5. Imports in commercial services include those used for intermediate inputs (or service offshoring) as well as those used for individual and government consumption. Since most commercial service imports are used for intermediate inputs by the business sector, its distribution by trading partners provides a reasonable indicator of the main providers of service offshoring in Canada.

Table 5
The share of services imports by trading partners

	1973	1990	2006
	percent		
Share of services imports originating from			
United States	78.00	72.37	68.10
United Kingdom	7.54	6.70	3.96
Foreign countries other than United States and United Kingdom	14.53	20.93	27.94
Other European Union countries	5.00	5.70	8.03
Japan	1.51	1.52	6.47
Other OECD[1] countries	2.19	3.31	2.56
All other countries	5.96	10.39	10.88

1. Organisation for Economic Co-operation and Development.

Notes: Other European Union countries include Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal and Spain; and from January 1995, it includes Austria, Finland, and Sweden. Other Organisation for Economic Co-operation and Development countries include Australia, Iceland, New Zealand, Norway, Switzerland, Turkey; from July 1994, Mexico; from December 1995, the Czech Republic; from May 1996, Hungary.

Source: Statistics Canada, Balance of Payments.

Most Canadian offshoring of services is with the United States and other high-wage countries. Service offshoring to low-wage countries represents a small portion of service offshoring in Canada, but it has increased its share over time. The share of commercial services imports originating from non-OECD (Organisation for Economic Co-operation and Development) or non-European countries, which include China, India and other low-wage countries, increased from 6.0% in 1973 to 10.9% in 2003.

From 1990 to 2005, the share of service imports from low-wage countries was virtually unchanged. This is in a sharp contrast to material imports from low-wage countries. Over the last 15 years, the share of material imports from low-wage countries showed a dramatic increase (Beckman and Goldfarb 2007).

2.2 Outsourcing and offshoring at the industry level

In this section, we present trends in offshoring and outsourcing at the industry level. For this purpose, we have divided the business sector into three major sectors: two goods-producing sectors (the primary and construction sector, and the manufacturing sector); and service-producing sectors.

Trends in outsourcing in major sectors

Trends in outsourcing of materials and services inputs are presented in Table 6. To examine if the trend has changed over time, we have divided the 1961-to-2003 period into two of equal length: 1961 to 1982 and 1982 to 2003.

Table 6
The share of intermediate inputs in gross output by major sectors, 1961, 1982 and 2003

	1961	1982	2003	Change 1961 to 1982	Change 1982 to 2003
	percent				
Total non-energy intermediate inputs					
Primary and construction	43.17	40.14	44.20	-3.03	4.06
Manufacturing	61.26	67.42	65.95	6.15	-1.47
Services-producing sector	28.96	30.49	37.99	1.54	7.49
Service outsourcing					
Primary and construction	6.43	9.85	13.02	3.42	3.17
Manufacturing	7.18	7.88	10.41	0.71	2.53
Services-producing sector	18.09	22.54	31.51	4.45	8.97
Material outsourcing					
Primary and construction	36.73	30.29	31.18	-6.45	0.89
Manufacturing	54.09	59.53	55.54	5.44	-3.99
Services-producing sector	10.87	7.95	6.47	-2.91	-1.48
Addendum – Share of services in non-energy inputs					
Primary and construction	14.91	24.55	29.46	9.64	4.91
Manufacturing	11.71	11.69	15.78	-0.02	4.09
Services-producing sector	62.48	73.92	82.96	11.45	9.03

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

The share of material and service inputs in gross output was highest in the manufacturing sector, and was the lowest in the services sector. In 2003, the cost of material and services input accounted for 66.0% of gross output in the manufacturing sector. It accounted for 38.0% of gross output in the service sector. But the service sector experienced the highest growth in non-energy intermediate input intensity over time. Further, the growth was accelerating over time. For the 1961-to-2003 period, the share of material and service inputs increased from 29.0% to 38.0%, which represents a 9.0-percentage-point increase. Most of the growth in the non-energy intermediate inputs occurred in the second half of the period. Changes in technology or changes in the types of products that were needed for the production of output in the service sector, has led to more radical changes in the nature of firm boundaries in the service sector.

The composition of non-energy intermediate inputs differed by industry. In the service sector, most of non-energy intermediate inputs represent the cost of purchased services. In contrast, most of non-energy intermediate inputs in the goods sector come from material inputs. Purchased services accounted for 83.0% of total non-energy inputs in the services sector in 2003. It accounted for 29.5% of total non-energy inputs in the primary and construction sector and 15.8% in the manufacturing sector.

There has been a steady increase in the share of service inputs in the goods-producing and service-producing sectors. The share of services inputs in total non-energy inputs increased from 62.5% to 83.0% in the service sector over the 1961-to-2003 period. It rose from 14.9% to 29.5% in the primary and construction sector over the period.

The share of services inputs in total non-energy inputs rose from 11.7% to 15.8% in the manufacturing sector. Most of the increase occurred after the early 1980s. Since the early 1980s, manufacturing firms have increasingly outsourced less efficient service activities in order to focus on their core competencies (Siegel and Griliches 1992; Fixler and Siegel 1999).

Trend in offshoring in the major sectors

Trends in offshoring are presented in Table 7 for the three major sectors: primary and construction; manufacturing; and services. Service offshoring is mostly in the service-producing sectors, and it has also grown the fastest in the services sector (Figure 6). In 2003, service offshoring in the service sector accounted for 70% of overall service offshoring in Canada (Table 8).

Table 7
The share of imports in intermediate inputs by major sectors, 1961, 1982 and 2003

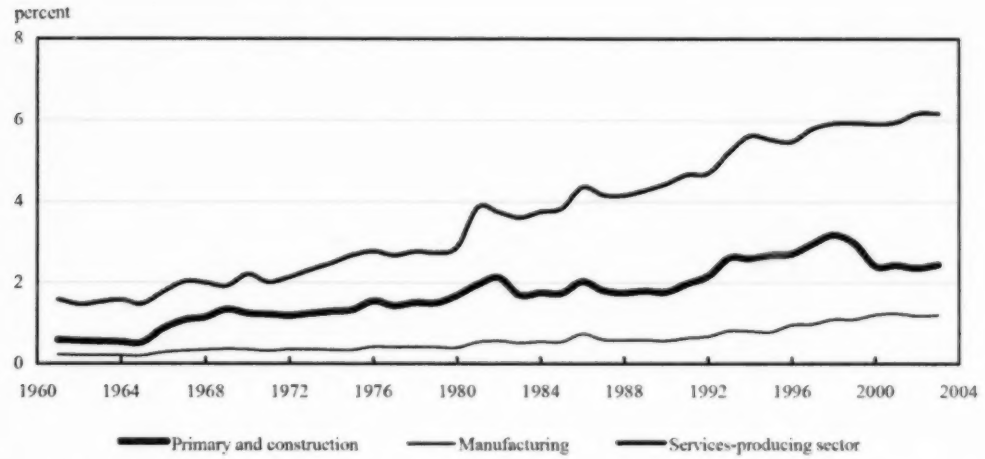
	1961	1982	2003	Change 1961 to 1982	Change 1982 to 2003
	percent				
Offshoring of materials and services					
Primary and construction	13.39	13.81	20.25	0.43	6.44
Manufacturing	22.09	28.05	38.85	5.97	10.80
Services-producing sector	4.80	7.83	10.19	3.03	2.36
Service offshoring					
Primary and construction	0.58	2.12	2.44	1.54	0.32
Manufacturing	0.22	0.56	1.20	0.34	0.64
Services-producing sector	1.58	3.74	6.17	2.15	2.43
Material offshoring					
Primary and construction	12.81	11.69	17.82	-1.12	6.13
Manufacturing	21.86	27.49	37.65	5.63	10.17
Services-producing sector	3.21	4.09	4.02	0.88	-0.07
Addendum – Share of services in the material and service offshoring					
Primary and construction	4.33	15.37	12.04	11.04	-3.33
Manufacturing	1.02	2.01	3.09	0.99	1.08
Services-producing sector	33.01	47.74	60.54	14.72	12.80

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

Material offshoring is largest in the goods-producing sector, and it has grown the fastest in the goods sector (Figure 7). In 2003, imported material inputs in the services sector accounted for about 7% of overall imports in material inputs (Table 8). The low level of material offshoring in the service sector is due to a small share of material inputs in the service sector.[6]

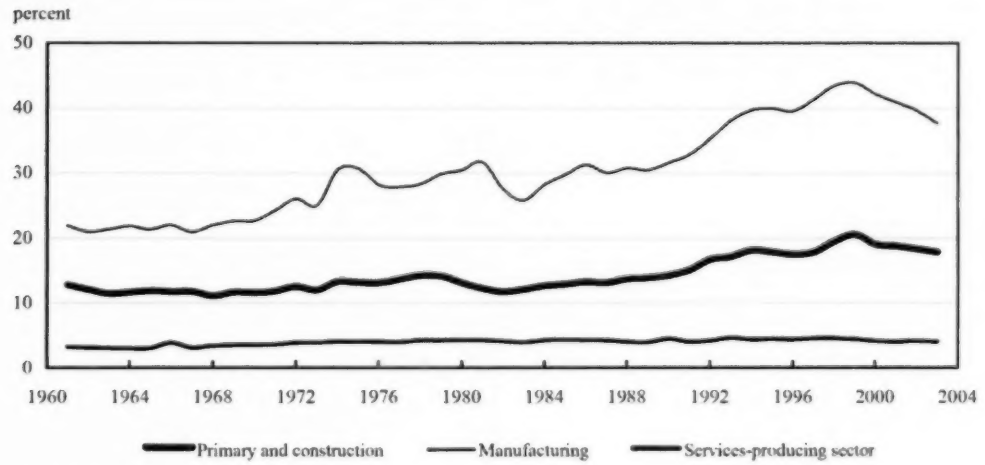
6. The import intensity (share of imported services in total services inputs) is similar between the manufacturing and services sectors.

Figure 6
Share of imported services in total material and service inputs by sector, 1961 to 2003



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

Figure 7
Share of imported material inputs in total material and service inputs by sector, 1961 to 2003



Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

Table 8
Industry distribution of imports in service inputs and material inputs, 1961, 1985 and 2003

	1961	1985	2003
	percent		
Service offshoring			
Primary and construction	21.7	22.4	13.6
Manufacturing	20.0	16.9	16.5
Service-producing sector	58.3	60.6	69.9
Material offshoring			
Primary and construction	18.8	14.1	15.0
Manufacturing	76.5	80.1	78.2
Service-producing sector	4.6	5.8	6.9

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

3 Conclusions

Outsourcing occurs as firms reorganize production processes. Buying, rather than producing, their own inputs is done by a firm to take advantage of cost savings. Trends in doing this presage major changes in the importance of large integrated firms, as opposed to decentralized supply networks with each participant doing only a small part of the work.

Firms constantly adjust their make-or-buy decisions at the margin. While examples can always be found of particular instances where the firm's margin is either expanding or contracting, the issue that we address here is whether there has been any major change on average in the degree of outsourcing across a wide range of Canadian industries. The data show that that there has been little, if any, change in the overall outsourcing of materials since 1960.

This is not the case for service inputs. The outsourcing of service inputs has been taking place for a considerable period. Service outsourcing has been greatest in the service sector. This tendency reflects several forces. First, service industries have matured from single-establishment entities to large multi-establishment firms that offer critical business services at lower costs, due to the exploitation of economies of scale. The provision of computerized payrolls is one example. The evolution of large general-accounting firms is another. In each of these cases, movement of some services that used to be provided in-house has occurred as firms in both manufacturing and services moved some production processes outside.

Those interested in outsourcing often also discuss offshoring—the tendency of inputs to be increasingly sourced abroad. Offshoring, of course, can result from increased outsourcing, or be completely separate from it. For example, material outsourcing has not increased, but material offshoring has. This is probably the result of the general move to trade liberalization that Canada has experienced over the last four and a half decades. But service offshoring has increased at the same time as service outsourcing. Service offshoring, in the case of business services, is primarily related to outsourcing, since the import intensity of business service inputs has remained relative constant over time. But in the case of other services—real estate, finance, insurance—the import ratio has gone up at the same time as service outsourcing in these areas

has increased. The advantages in these areas that come from sourcing foreign services have led to a gradual increase in the share of services that are accounted for by imports.

The growth in both services and material offshoring reflects the continuing trend in globalization and integration of world economies. Material offshoring reflects the two forces of globalization: gains from exploiting comparative advantage and gains from the exploitation of scale economies in differentiated product lines. Service offshoring reflects the force of scale economies and product differentiation.

Appendix

Table A.1
Outsourcing and offshoring of service inputs at the industry level

Industries	Share of services in gross output		Import share of service inputs	
	Level in 2003	Change 1961 to 2003	Level in 2003	Change 1961 to 2003
	percent			
Agriculture, forestry, fishing and hunting	11.64	5.53	8.04	6.49
Mining, and oil and gas extraction	13.29	5.58	8.22	4.84
Utilities	11.28	2.91	5.10	4.17
Construction	13.83	7.89	9.07	3.16
Food manufacturing	8.71	2.47	6.67	5.26
Beverage	18.46	3.07	7.28	5.43
Tobacco	23.96	13.54	8.22	6.88
Textile and textile product mills	8.66	2.98	6.49	4.78
Clothing manufacturing	9.09	1.59	5.57	4.39
Leather and allied products	9.32	3.12	6.92	5.26
Wood product manufacturing	6.99	1.49	6.32	4.76
Paper manufacturing	10.06	5.04	6.58	3.76
Printing and related support activities	12.51	1.68	5.64	3.14
Petroleum and coal products	6.41	0.25	8.87	7.54
Chemical manufacturing	13.89	1.51	6.56	4,79
Plastics and rubber products	10.20	2.08	7.39	6.12
Non-metallic mineral products	11.88	1.86	6.93	5.40
Primary metal manufacturing	6.61	2.95	7.25	4.75
Fabricated metal products	7.51	1.70	6.75	3.88
Machinery manufacturing	8.46	0.52	6.56	4.02
Computer and electronic products	16.88	7.05	8.32	6.17
Electrical equipment and appliances	13.38	5.25	8.00	5.80
Transportation equipment	12.24	5.37	9.49	7.13
Furniture and related products	8.90	2.04	5.79	3.86
Miscellaneous manufacturing	10.25	-0.01	6.35	4.50
Wholesale	34.50	15.36	7.05	4.80
Retail	30.64	11.38	7.22	5.05
Transportation and warehousing	31.27	10.90	8.65	5.54
Information and cultural industries	32.06	17.88	9.20	5.23
Finance, real estate and insurance	37.71	15.75	7.95	5.56
Professional, scientific and technical services	31.97	17.65	6.95	2.09
Other services of the business sector	22.65	10.66	5.43	3.80
Simple average	15.79	5.85	7.21	4.95

Note: Authors' calculations from data.
Source: Statistics Canada, Input-Output Accounts.

Table A.2
Outsourcing and offshoring of material inputs at the industry level

Industries	Share of materials in gross output		Import share of material inputs	
	Level in 2003	Change 1961 to 2003	Level in 2003	Change 1961 to 2003
	percent			
Agriculture, forestry, fishing and hunting	44.29	17.16	15.71	2.72
Mining, and oil and gas extraction	14.64	1.49	22.50	3.33
Utilities	3.49	1.27	49.95	49.51
Construction	44.59	-9.13	29.09	13.74
Food manufacturing	63.28	-5.64	19.44	3.10
Beverage	35.77	6.48	26.62	8.71
Tobacco	21.20	-40.43	13.19	9.10
Textile and textile product mills	51.07	-8.44	62.53	21.78
Clothing manufacturing	46.54	-6.37	52.87	17.12
Leather and allied products	50.10	-1.78	66.73	36.76
Wood product manufacturing	54.80	-0.57	11.85	4.01
Paper manufacturing	49.36	3.43	26.87	17.48
Printing and related support activities	40.62	2.67	43.18	30.65
Petroleum and coal products	78.66	6.03	47.68	-2.87
Chemical manufacturing	44.89	2.13	44.05	15.37
Plastics and rubber products	49.74	-0.38	57.21	21.89
Non-metallic mineral products	38.98	2.14	26.90	7.89
Primary metal manufacturing	57.69	-0.14	40.83	16.39
Fabricated metal products	48.62	-1.40	33.68	15.62
Machinery manufacturing	49.38	5.70	53.30	25.04
Computer and electronic products	53.05	14.43	71.76	31.98
Electrical equipment and appliances	52.12	2.97	53.49	31.37
Transportation equipment	62.82	6.34	65.44	24.91
Furniture and related products	47.30	-0.69	36.96	13.57
Miscellaneous manufacturing	45.08	1.00	55.38	22.69
Wholesale	3.34	-5.39	32.65	26.21
Retail	2.67	-5.85	22.34	16.43
Transportation and warehousing	5.89	-1.25	45.51	27.94
Information and cultural industries	10.43	-3.33	37.58	29.00
Finance, real estate and insurance	2.07	-2.67	2.57	2.31
Professional, scientific and technical services	6.89	0.99	9.12	3.75
Other services of the business sector	14.21	-10.31	21.07	11.77
Simple average	37.30	-0.92	37.44	17.48

Note: Authors' calculations from data.
Source: Statistics Canada, Input–Output Accounts.

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